UROGYNECOLOGY

Lifetime physical activity and pelvic organ prolapse in middle-aged women

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OBJECTIVE: To determine, in a case-control study, whether pelvic organ prolapse (POP) is associated with overall lifetime physical activity (combined leisure, outdoor, household, occupational), and lifetime leisure, lifetime strenuous, and teen years strenuous activity.

STUDY DESIGN: One hundred ninety-one POP cases (defined as maximal vaginal descent ≥1 cm below the hymen) and 191 age and recruitment-site matched controls (defined as maximal vaginal descent ≤1 cm above the hymen) between 39-65 years with no or mild urinary incontinence, were recruited chiefly from primary care clinics. Participants completed Lifetime Physical Activity and Occupation Questionnaires, recalling activities during 4 age epochs. We performed separate logistic regression models for physical activity measures.

RESULTS: Compared with controls, POP cases had greater body mass index and parity. Median overall lifetime activity, expressed in metabolic equivalents-hours/week, did not differ significantly between cases and controls. In adjusted analyses, we observed no associations between odds of POP and overall lifetime physical activity, lifetime leisure activity, or lifetime strenuous activity. There was a marginally significant nonlinear relationship between teen strenuous activity and POP with an increase in the log-odds of POP for women reporting ≥21 hours/week of strenuous activity ($P = .046$).

CONCLUSION: Lifetime physical activity does not increase the odds of anatomic POP in middle-aged women not seeking care for POP. Strenuous activity during teenage years may confer higher odds of POP. This relationship and the potential role of physical activity and POP incidence should be evaluated prospectively.

Key words: exercise, leisure, pelvic organ prolapse, physical activity, strenuous activity

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Physical activity is crucial in maintaining health, but high intensity activity increases risk for injury.[1] Understanding how physical activity impacts pelvic organ prolapse (POP) is important: in their lifetimes, up to 1 in 5 women have surgery for POP.[2] Childbirth, in particular vaginal delivery, increases the risk of POP, but our understanding of other potentially modifiable risk factors is limited.[3-5] Prevailing expert opinion holds that chronic repetitive straining, heavy lifting and high-impact activity can eventually produce changes in muscles, ligaments and connective tissue, leading to POP. To prevent POP, the American Urogynecologic Society recommends avoiding heavy lifting and repetitive strenuous activities.[6]

Women with POP appear more likely to report strenuous jobs than women without.[7-10] However, limitations of published studies include not considering confounders, poorly defining occupational and activity histories, using nonstandardized POP outcomes, and excluding household activities, which represent a large portion of daily activity for many women. No study systematically assesses lifetime activity. Exploring the association between lifetime physical activity and POP cannot ethically be done in a randomized trial; a life-long cohort study, although possible, would be infeasible. Therefore, we conducted this case-control study to determine whether POP, defined by structured pelvic examination, is associated with (1) overall lifetime activity (leisure, outdoor, household, and occupational), (2) lifetime leisure activity, (3) lifetime strenuous activity, and (4) strenuous activity during the teen years. We analyzed strenuous activity

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TABLE 1
Activities classified as strenuous

Activity
Aerial dance trapeze
Backpacking
Bailing hay
Basketball
Carrying large pails of water or feed
Carrying loads over 30 lb
Cheerleading
Chopping wood
Cleaning large animal pens/farm work
Climbing >10 flights of stairs per day
European (team) handball
Field hockey
Football
Hangliding/windsurfing
Health club exercise, general
Heavy carpentry
Heavy garden work (shoveling, turning soil)
Heavy housecleaning
High jumping (track and field)
Jet ski
Jumping on trampoline
Jumping rope
Kickball
Kickboxing
Lacrosse
Lifting >30 lb from floor
Lifting >30 lb from counter height
Lifting heavy weights (recreational/fitness)
Lifting or carrying children or dependent elder
Martial arts (all varieties)
Motorcycle racing (motor cross)
Moving heavy furniture without assistance
Mowing lawn with push mower
Other racquet sports
Rock climbing
Rugby
Skiing, downhill; snowboarding
Snow shoveling by hand
Soccer
Softball/baseball
Springboard diving
Sprinting
Tennis
Ultimate Frisbee
Volleyball
Wallyball
Water skiing

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during teen years as it is plausible that such activity, during this period of rapid changes in musculoskeletal structure, hormones, and weight, could influence pelvic floor integrity.

Materials and Methods

Institutional review boards of the University of Utah and Intermountain Healthcare approved this study. All participants completed an informed consent process. Detailed study methods have been published.[11]

Research nurses recruited women attending 1 of 17 primary care level gynecologic and family medicine clinics located across the Salt Lake Valley. Initially, we also recruited women from community advertising (flyers, brochures) but as relatively few women responded, relied primarily on in-person recruitment.

Women were initially excluded if they were pregnant or within 6 months postpartum, <39 or >65 years, had prior surgical treatment for POP or incontinence, were not able to walk independently, had medical conditions associated with pelvic floor disorders or low physical activity (uncontrolled diabetes, neurologic disorders such as multiple sclerosis, spinal cord injury, or stroke, rheumatoid arthritis, radical hysterectomy or pelvic irradiation), had urgency-predominant incontinence, were currently undergoing treatment for cancer, or were unable to complete questionnaires. Underweight women (body mass index [BMI] <18.5 kg/m^2) and women in obesity class III (BMI ≥40 kg/m^2) were excluded as they are more likely to have functional and activity limitations. We chose the age range 39−65 years to reflect the population, included in the original validation of the physical activity instrument chosen for this study,[12] which is likely to have developed POP and is still of an age likely to engage in a variety of physical activities. Trained research nurses performed the Pelvic Organ Prolapse Quantification (POP-Q), a reproducible method for assessing vaginal support.[13-15] We defined POP as present when any segment of the vagina descended at least 1 cm below the hymen (≥+1 cm) and absent when all vaginal segments were at least 1 cm above the hymen (≤−1 cm). We did not standardize the time of POP-Q examinations, as others found no differences in POP-Q values between examinations done in the morning or afternoon.[16] All participants voided immediately before the examination.

To assess lifetime physical activity, we used the self-administered, reliable, and valid Lifetime Physical Activity Questionnaire (LPAQ) designed for use in women.[12,17] The LPAQ assesses physical activity over 4 age periods, menarche to age 21, 22-34, 35-50, and 51-65 years, and includes leisure activity, outdoor work, and housework. The LPAQ is scored using metabolic equivalents (METs) obtained from the Compendium of Physical Activities[18] to calculate MET hours per week. METs provide a way to standardize absolute activity intensity that reflects multiples of the resting metabolic rate (Table 3 legend). Because the LPAQ does not query occupational activity, we added the Occupation Questionnaire (OQ), a component of the Lifetime Overall Physical Activity Questionnaire (LTPAQ).[19]

We obtained overall lifetime physical activity by multiplying the MET score